IN THE CLAIMS:

Please amend the Claims so as to read as follows:

1. (Currently Amended) ~~An~~ A self-cleaning electron emission device comprising:

an electron emitter ~~that includes~~ including a lower electrode, an upper electrode made of a thin film, and a semiconductor layer formed between the lower electrode and the upper electrode, a surface of the upper electrode being exposed to an external space;

a counter electrode disposed~~that is provided~~ opposite the upper electrode across the external space;

~~a fine particle charging~~ first voltage control means ~~section that applies~~ for selectively applying between the lower and upper electrodes (i) an electron emitting voltage having a polarity for accelerating electrons in the semiconductor layer~~,~~ such that the accelerated electrons are passed ~~passing the electrons~~ through the upper electrode~~,~~ and ~~emitting the electrons~~ emitted to the external space, ~~or~~ (ii) a predetermined voltage for charging fine particles ~~attached to~~ adhered to the surface of the upper electrode ~~between the upper electrode and the lower electrode~~, (ii) a voltage of opposite polarity to the polarity of the electron emitting voltage, or (iv) no voltage; and

~~a flying~~ second voltage control means ~~section that applies,~~ for selectively applying at least one voltage between the upper electrode and the counter electrode~~,~~ having a predetermined relationship to the voltage applied between the lower and upper electrodes by the first voltage control means such that with no atmospheric discharge (i) emitted accelerated electrons are transferred toward the counter electrode, and/or (ii) ~~a voltage for allowing the~~ subsequent to being charged by the electron emitter, charged fine particles are caused to fly from the surface of the upper electrode toward ~~to~~ the counter electrode~~,~~

~~whereby providing the electron emission device with a cleaning function~~.

2. (Currently Amended) The self-cleaning electron emission device according to claim 1, wherein the semiconductor layer is a porous polysilicon ~~silicon~~ semiconductor layer in which a part or all of the polysilicon is made porous.

3. (Currently Amended) The self-cleaning electron emission device according to claim 1, wherein the counter electrode has a semiconductive layer or an insulating layer formed on a ~~its~~ surface facing the upper electrode.

4. (Currently Amended) The self-cleaning electron emission device according to claim 1, wherein the second ~~flying~~ voltage control means ~~section~~ applies a pulsed voltage so that the counter electrode has a positive potential relative to the upper electrode when the predetermined relationship between the voltage applied between the upper and lower electrodes and the voltage applied between the upper electrode and the counter electrode is such that fine particles adhered to the surface of the upper electrode are caused to fly from the upper electrode toward the counter electrode..

5. (Currently Amended) The self-cleaning electron emission device according to claim 1, wherein the voltages applied by the first voltage control means and by the second voltage control means are related to one another such that:

~~the flying voltage control section operates a control to apply the voltage having a first voltage value to the external space between the upper electrode and the counter electrode, and~~

~~after the fine particle charging voltage control section applies a~~ during the application of the predetermined voltage between the upper electrode and the lower electrode so as to charge the fine particles ~~attached to~~ adhered to the surface of the upper electrode by the first voltage control means, the ~~flying~~ second voltage- control means ~~control section operates a control to apply~~ applies a voltage having a first value; and

thereafter, the second voltage control means applies a voltage having ~~the voltage having~~ a second ~~voltage~~ value higher than the first ~~voltage~~ value, the second voltage value having such a magnitude that ~~allows~~ the charged fine particles are caused to fly from the upper electrode ~~to~~ toward the counter electrode and that atmospheric discharge does not occur, and the ~~fine particle charging~~ first voltage control ~~section~~ means concurrently operates so as ~~a control~~ to either apply a voltage having an opposite polarity to a polarity of the electron emitting voltage or apply no voltage between the upper electrode and the lower electrode, thereby allowing the charged fine particles to fly from the surface of the upper electrode toward ~~to~~ the counter electrode.

6. Cancelled, without prejudice.

7. (Currently Amended) The self-cleaning electron emission device according to claim 1, wherein the second ~~flying~~ voltage control means ~~section~~ applies a voltage between the upper electrode and the counter electrode when the electrons are not emitted from the electron emitter such ~~so~~ that the surface of the upper electrode of the electron emitter is negative.

8. (Currently Amended) The self-cleaning electron emission device according to any one of claims 1-7, for use in a laser printer or a digital copying machine.

9. (Currently Amended) The electron emission device according to ~~claim 1~~ any one of Claims 1-7, wherein the fine particles include dust such as toner and paper particles.

Please add new Claims 10-17 as follows:

10. (New) A method for cleaning fine particles from an electron emission device comprising:

an electron emitter including a lower electrode, an upper electrode made of a thin film, and a semiconductor layer formed between the lower electrode and the upper electrode, a surface of the upper electrode being exposed to an external space;

a counter electrode disposed opposite the upper electrode across the external space;

first voltage control means for selectively applying between the lower and upper electrodes (i) an electron emitting voltage having a polarity for accelerating electrons in the semiconductor layer such that the accelerated electrons are passed through the upper electrode and emitted to the external space, (ii) a predetermined voltage for charging fine particles adhered to the surface of the upper electrode , (ii) a voltage of opposite polarity to the polarity of the electron emitting voltage, or (iv) no voltage; and

second voltage control means for selectively applying at least one voltage between the upper electrode and the counter electrode having a predetermined relationship to the voltage applied between the lower and upper electrodes by the first voltage control means;

said method comprising the steps of:

applying the predetermined voltage for charging fine particles adhered to the surface of the upper electrode between the upper electrode and the lower electrode while at the same time applying a voltage having a predetermined relationship to the voltage applied between the upper electrode and the lower electrode between the upper electrode and the counter electrode for a period sufficient for the fine particles adhered to the surface of the upper electrode to assume a predetermine level of charge;

thereafter, applying a voltage for causing the charged fine particles to fly toward the counter electrode from the upper electrode between the upper electrode and the counter electrode without atmospheric discharge while at the same time applying between the upper and lower electrodes either no voltage or a voltage of opposite polarity to the polarity of the voltage then being applied between the upper electrode and the counter electrode; and

thereafter, applying between the upper electrode and the lower electrode an electron emitting voltage for accelerating electrons in the semiconductor layer such that the accelerated electrons are passed through the upper electrode and emitted to the external space while at the same time applying a voltage having a predetermined relationship to the voltage then being applied between the upper electrode and the lower electrode so as to convey the emitted electrons toward the counter electrode through the external space.

11. (New) The method according to claim 10, wherein the semiconductor layer is a porous polysilicon semiconductor layer in which a part or all of the polysilicon is made porous.

12. (New) The method according to claim 10, wherein the counter electrode has a semiconductive layer or an insulating layer formed on a surface thereof facing the upper electrode.

13. (Currently Amended) The method according to claim 10, wherein the second voltage control means applies a pulsed voltage so that the counter electrode has a positive potential relative to the upper electrode during the period when the first control means applies either no voltage or a voltage of a polarity opposite to that of the voltage applied between the upper electrode and the counter electrode between the upper electrode and the lower electrode.

14. (New) The method according to claim 1, wherein the voltages applied by the first voltage control means and by the second voltage control means are related to one another such that:

during the application of the predetermined voltage between the upper electrode and the lower electrode so as to charge the fine particles adhered to the surface of the upper electrode by the first voltage control means, the second voltage control means applies a voltage having a first value; and

thereafter, the second voltage control means applies a voltage having a second value higher than the first value between the upper electrode and the counter electrode.

15. (New) The method according to claim 1, wherein the second voltage control means applies a voltage between the upper electrode and the counter electrode when the electrons are not emitted from the electron emitter such that the surface of the upper electrode of the electron emitter is negative.

16. (Currently Amended) The method according to any one of claims 10-15, for use in a laser printer or a digital copying machine that includes an electron emission device.

17. (Currently Amended) The method according to any one of Claims 10-15,

wherein the fine particles include dust such as toner and paper particles.